

UPDATE OF THE 2012 BLIND RESULTS WITH 13 fb^{-1}

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Update on the Low PT Analysis

- Outline
 - Status of Reanalysis of 2011 data
 - Changes since last week's talk
 - New Cutflows and plots for 2012 13fb^{-1} for $e\mu+\mu e$ 0-jet channel
 - Summary and Conclusions
- Looking at different sections:
 - Status of 2011 reanalysis: page 3
 - Changes since last week: page 3
 - Start of cutflows (blinded and unblinded MC) page 4
 - Blinded signal region plots: page 9
 - WW -0j control region plots: page 18
 - Summary and Conclusions: page 21

Analysis Details

- General Comment

- Only zero jets results shown today (excess in 2011 data was only in Njets=0)

- Status of Reanalysis of 2011 data

- Use Low PT 2012 lepton selection criteria.
- Use ntuples made by Antonio (tag-35).
- POWHEG at 7 TeV not yet available
- Wgamma* correction: use the 8 TeV for now
- Antonio made a run in September. I am rerunning now.

- Analysis of 2012 data

- Using -02-07 ntuples.
- Blinded MC and Data are shown. Also unblinded Cutflow for MC
- Normalization factors applied in CRs
- Systematics not included in plots
- Standard $(0.90) < \mu >$ rescaling

- Changes since a week ago

- Use v15.1 Tatsuya's $W+jets$ ntuples (13.1 last week)
- Normalization factors calculated with low PT events suffer from low statistics. We use the nominal analysis NF's to reduce systematics.

Cutflows

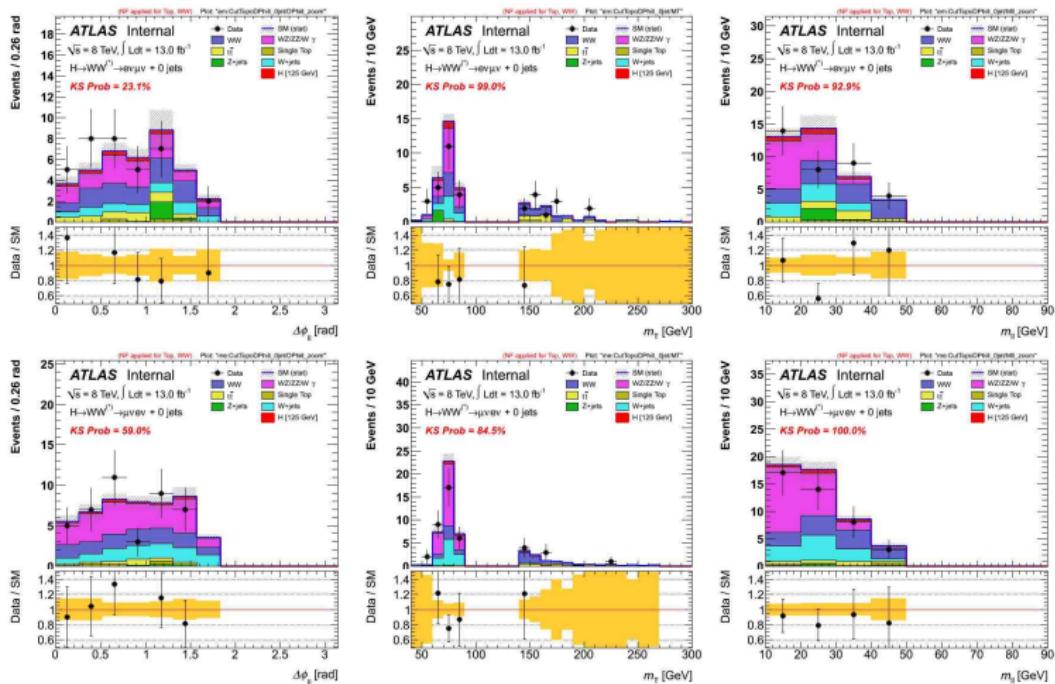
Expected Signal in the Low PT Sample

- Expect 18.7 ± 0.4 events with a background of 255 ± 5 in the 0 jet sample. S/B = 7.3%
- The nominal analysis found 76 events with a background of 774 events. Here S/B = 9.8%
- **Low PT is expected to add 18.7 events to the 76 (24.6%), but with a somewhat larger background.**
- Need to assess sensitivity gain, taking into account all the systematic uncertainties (Corrinne working on this).

Blinded signal region

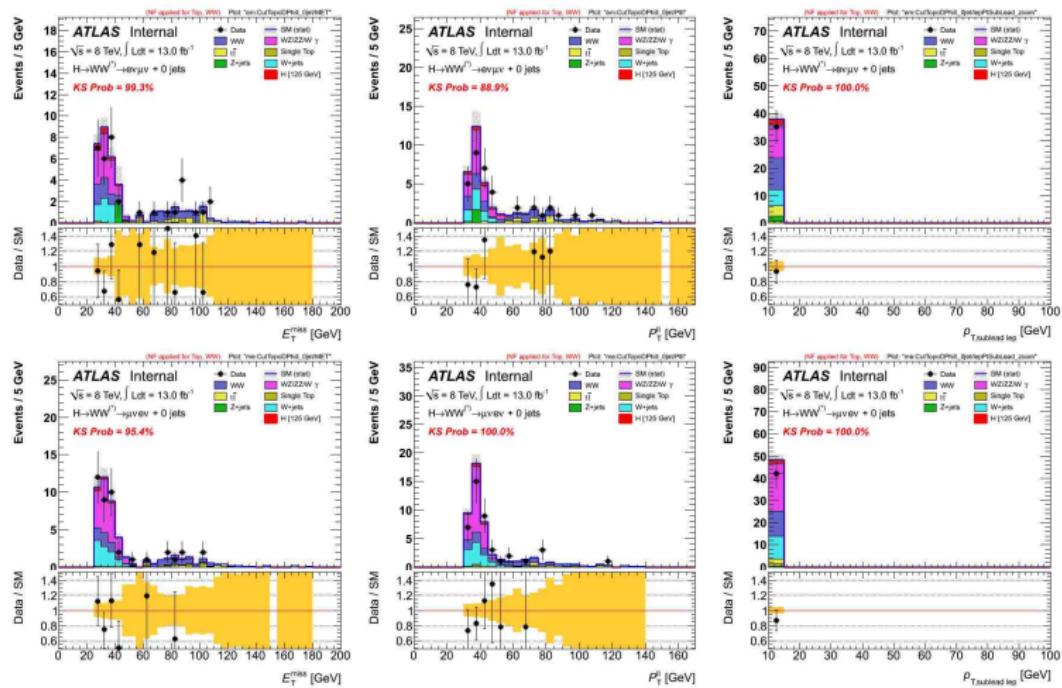
Blinded SR, $\Delta\varphi(\ell\ell) < 1.8$): $\Delta\varphi(\ell\ell), M_T, M_{ll}$

- Top: $e\mu$. Bottom: μe
- Agreement between data and MC is reasonable.**



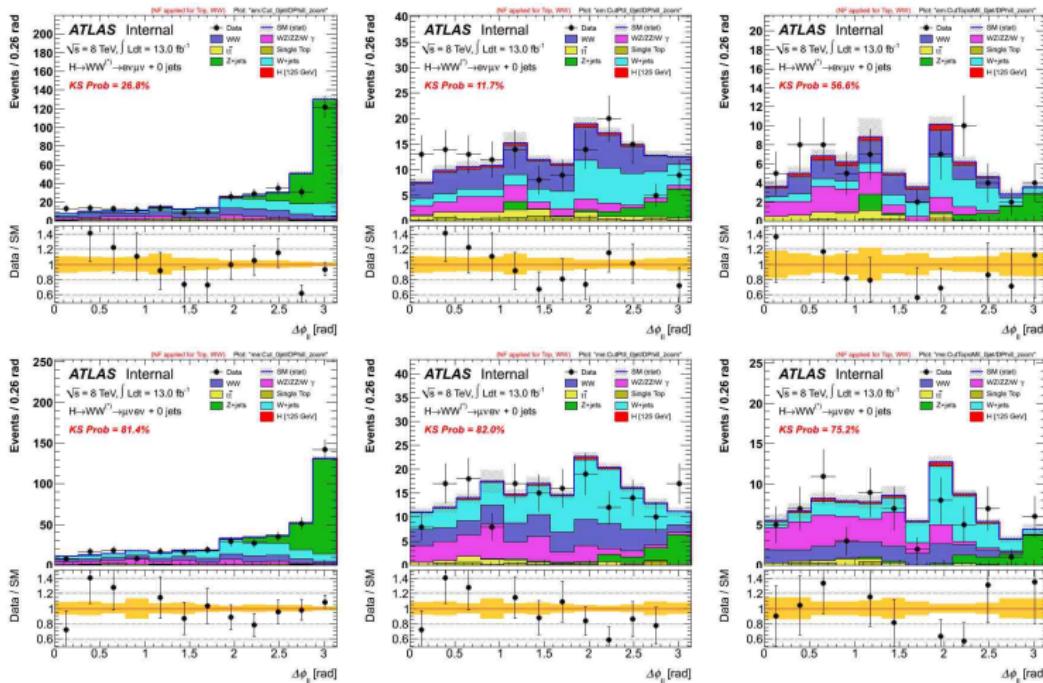
Blinded SR, $\Delta\varphi(\ell\ell) < 1.8$: $E_T^{\text{miss}}, p_T^{\ell\ell}, P_T$ Sublead lepton

- Top: $e\mu$, Bottom: μe
- Agreement between data and MC is reasonable.



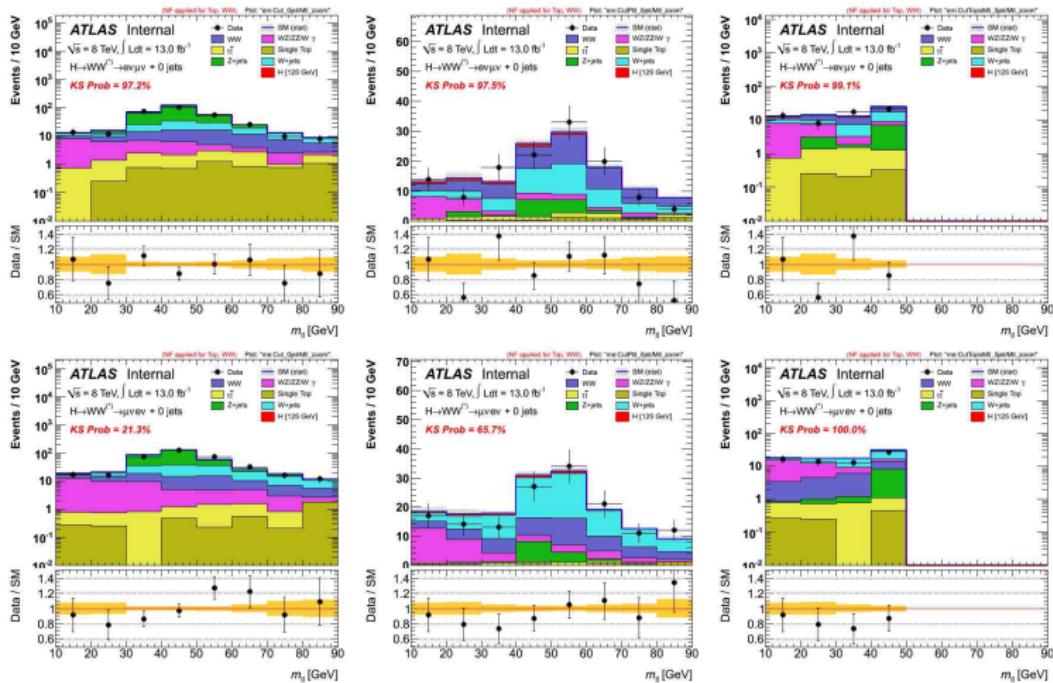
$\Delta\varphi(\ell\ell)$: at Jet Veto, after $p_T^{\ell\ell}$, after $M_{\ell\ell}$ Cuts

- Top: $e\mu$, Bottom: μe
- Agreement between data and MC is reasonable.



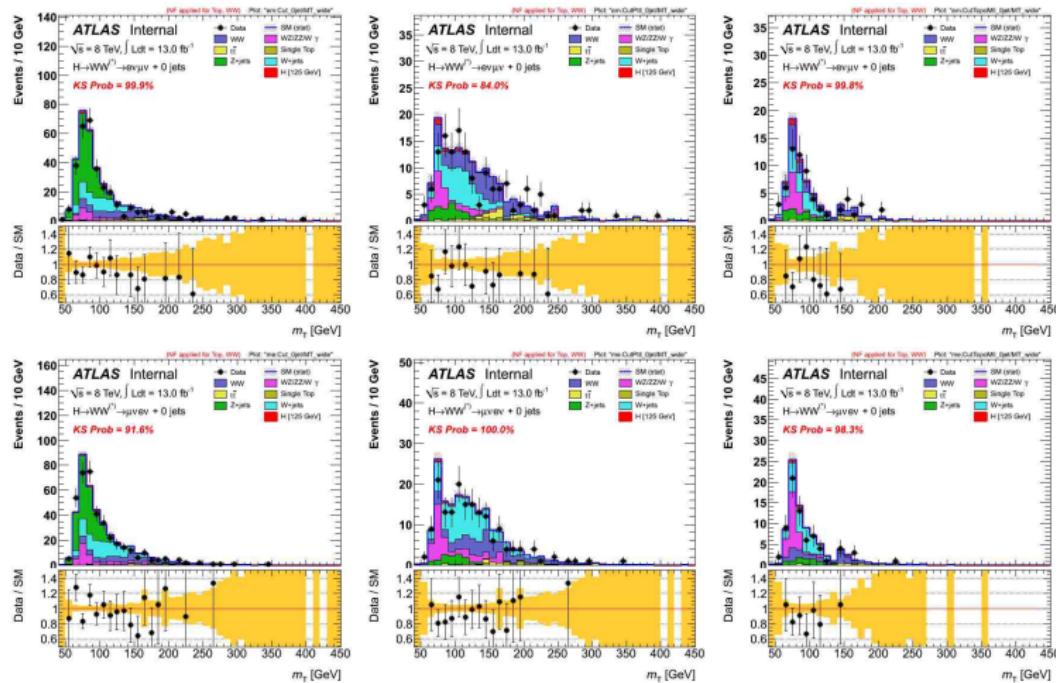
M_{ll} : at Jet Veto, after $p_T^{\ell\ell}$, after $M_{\ell\ell}$ Cuts

- Top: $e\mu$
- Bottom: μe



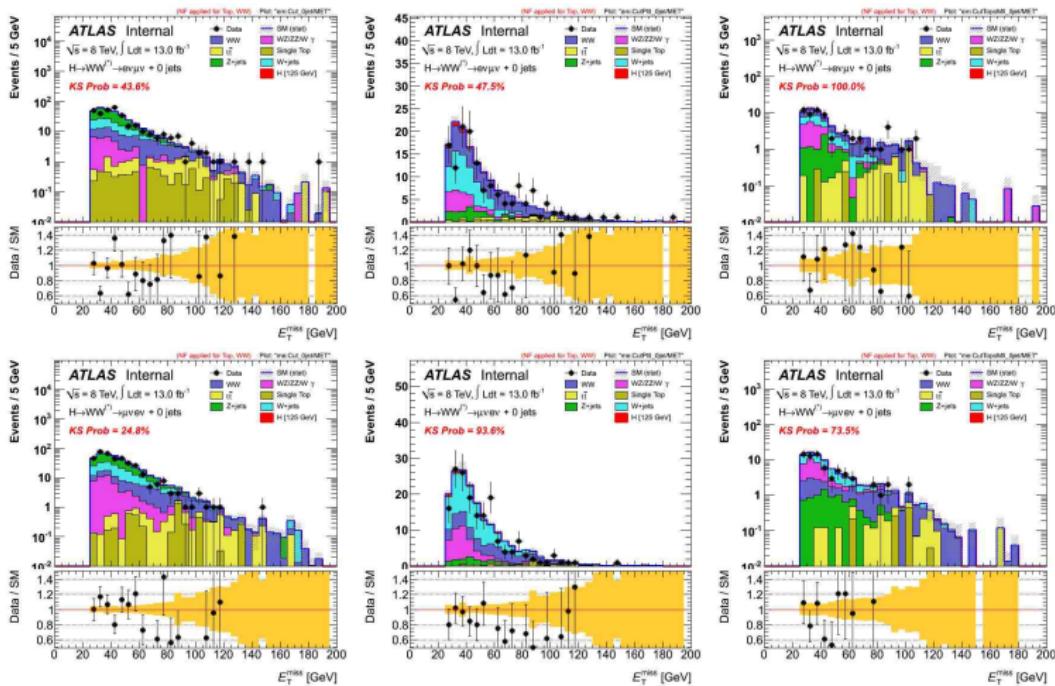
M_T : at Jet Veto, after $p_T^{\ell\ell}$, after $M_{\ell\ell}$ Cuts

- Top: $e\mu$
- Bottom: μe



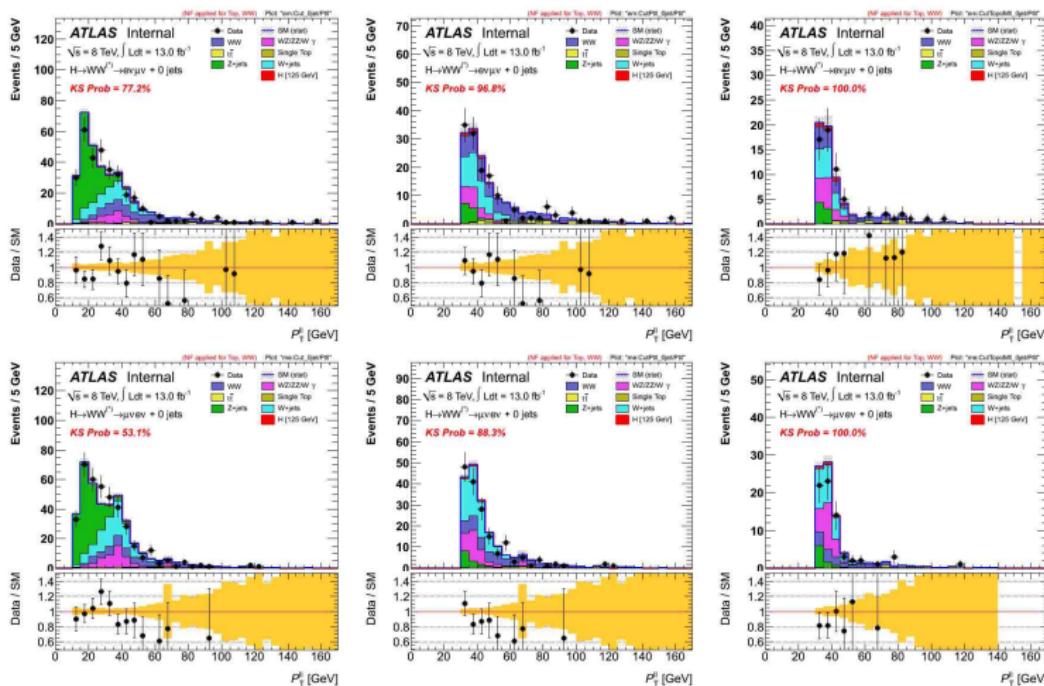
E_T^{miss} : at Jet Veto, after $p_T^{\ell\ell}$, after $M_{\ell\ell}$ Cuts

- Top: $e\mu$
- Bottom: μe



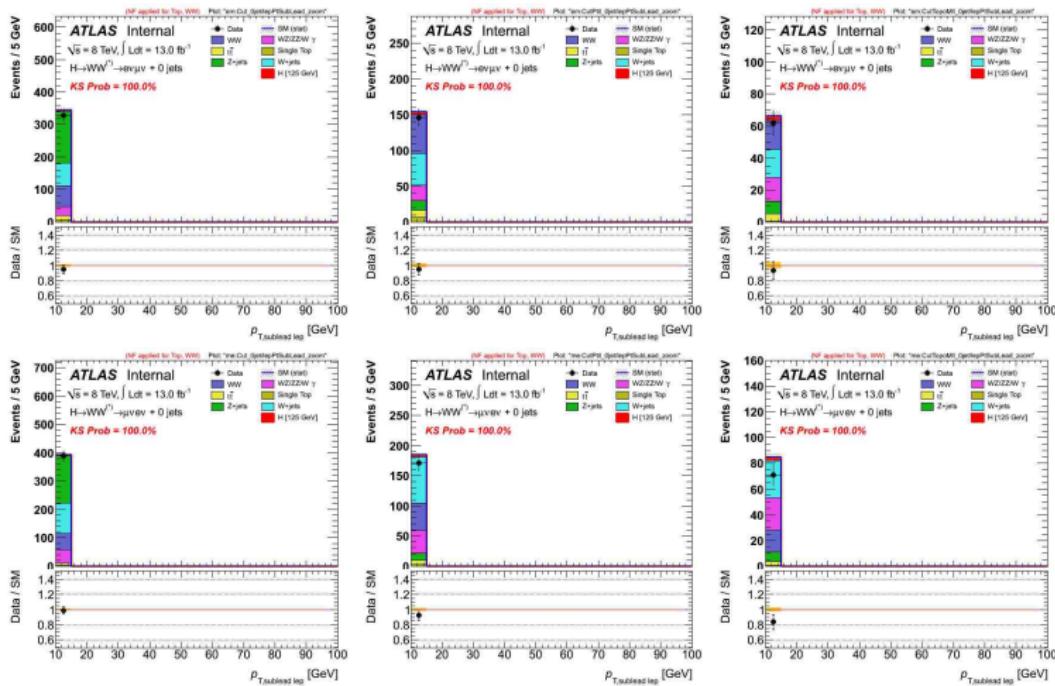
$p_T^{\ell\ell}$: at Jet Veto, after $p_T^{\ell\ell}$, after $M_{\ell\ell}$ Cuts

- Top: $e\mu$
- Bottom: μe



$P_T(\text{SubLead})$: at Jet Veto, after $p_T^{\ell\ell}$, after $M_{\ell\ell}$ Cuts

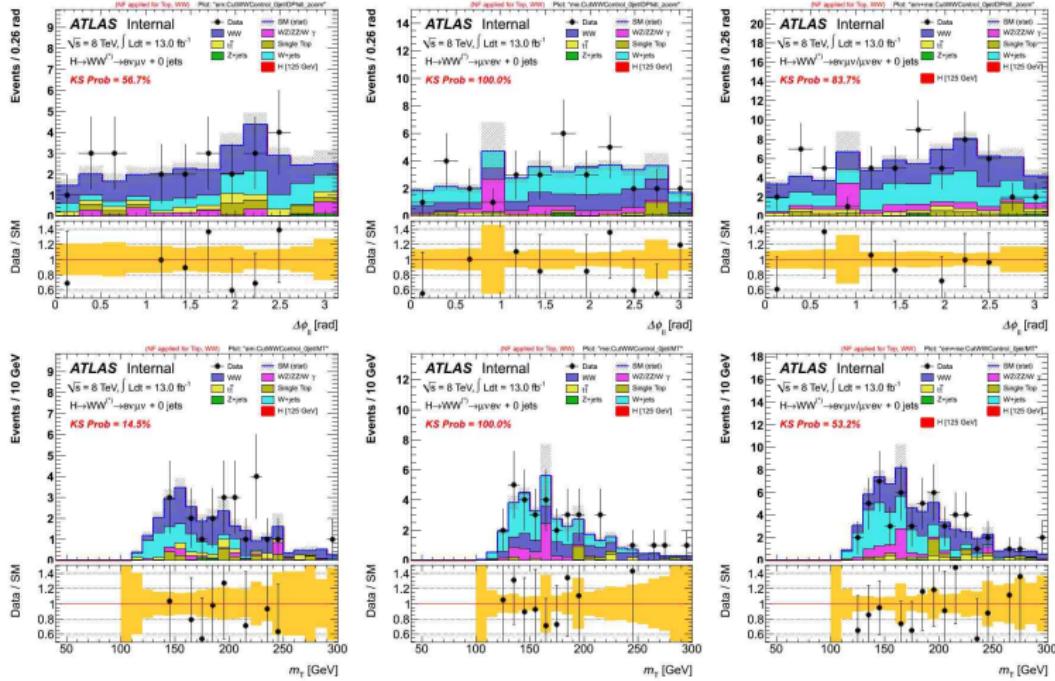
- Top: $e\mu$
- Bottom: μe



WW 0 jet CR

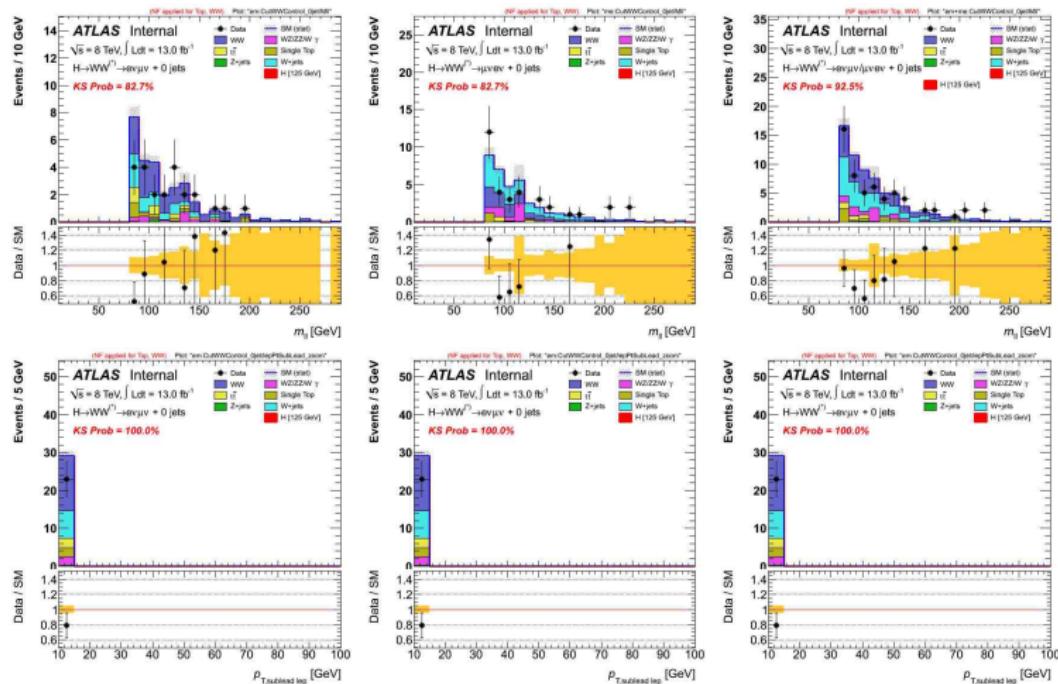
$\Delta\varphi(\ell\ell)$ and M_T in WW 0-jet CR

- $\Delta\varphi(\ell\ell)$ (top), M_T (bottom). $e\mu$, μe and sum (right).
- NF included in all plots. $e\mu$ shows mismodeling at large $\Delta\varphi(\ell\ell)$ as the nominal analysis.



$M_{\ell\ell}$ and P_T Sublead in WW 0-jet CR

- $M_{\ell\ell}$ (top) and P_T Sublead (bottom). $e\mu$, μe and sum (right)
- Normalization Factor included in all plots.



Summary

Summary and Conclusions

- Many checks and tests done on the 2011 data found no explanation for the excess observed in the $\Delta\varphi(\ell\ell)$ distribution.
- Will have soon the reanalysis of that data with more stringent lepton selection requirements.
- Comparison of **blinded 2012 low PT data** with expectation, shows no excess in several distributions
- Low Pt data would add 19 events to the 76 of the nominal analysis in the zero jets DF sample. This is about 25%
- **Need to assess the added sensitivity with realistic systematic uncertainties and correlations.**

Backup